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AUTHOR Kontos, Susan; Huba, Mary E.
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ABSTRACT

A program of research was conducted to define the most crucial aspects of print awareness and to develop a tool to measure the resulting construct, validate the instrument, and explore the role print awareness plays in the acquisition of young children's literacy skills. Four basic concepts concerning print that are necessary to give print relevance and utility to children were identified, and a 15-item instrument requiring prereaders to make print-related responses in order to correctly answer questions was developed. The instrument was first administered to a sample of nonreading preschool children in conjunction with interview questions similar to those of Downing (1970, 1972, 1973-74) and Reid (1966). Since item-discrimination indices and internal consistency of the instrument were found to be adequate, the validity of the instrument was then assessed through studies with preschool children of different ages and with second-grade children differing in reading achievement. It was found that performance increased with age and that the test discriminated between levels of reading ability. Two additional studies were conducted to explore possible confounding effects of socioeconomic status and intellectual ability. Findings indicated that the instrument is reasonably reliable and valid. (The relationships between children's print awareness, literacy, and reading achievement are discussed.) (RH)

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The Development and Function of Print Awareness

Susan Kontos

The Pennsylvania State University

Mary E. Huba

Iowa State University

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The Pennsylvania State University
University Park, PA 16802

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The purpose of my presentation is to describe a program of research that Mary Huba and I began nearly four years ago. The early part of those four years was primarily focused upon defining what we regarded as the most crucial aspects of print awareness and developing a tool to measure the resulting construct. More recently, in the process of validating our instrument, we have been concerned with the function of print awareness in learning to read. In other words, we are curious about the role print awareness plays in the acquisition of formal literacy skills in young children.

Mary and I originally became interested in this area when, after reading the research of Downing, Reid, etc. (Downing, 1972; Downing, 1970; Downing & Oliver, 1973-74; Francis, 1973; Reid, 1966) we were dissatisfied with the conception of print awareness as primarily the existence of a vocabulary and behaviors to apply to print-related materials in the environment. It seemed to us that there had to be something more basic to print awareness and more important to reading than being able to correctly apply the terms letter and word, for instance. We surmised that there were four other very basic concepts about print that are necessary for a child to see any utility or relevance to print and its functions. These four concepts were:

1) Language has a written symbol system;
2) People write down their language for efficient communication;
3) Reading is a process by which one deciphers written language to obtain meaning;
4) Written language can represent, in one-to-one correspondence, the words uttered by a speaker.

We then predicted that knowledge of these four basic concepts about print was separate from and thus uncorrelated with the terminology and procedural knowledge assessed previously by Downing (1970; 1972; Downing & Oliver, 1973-74) and Reid

(1966). In order to test our hypothesis, we first had to design an instrument to measure our four basic concepts about print.

From our perspective, the instrument we needed had several required characteristics. For one, it had to be objectively scored, quickly administered, and question children in a meaningful context without total reliance on verbal responses. This set of characteristics was viewed as an improvement over previously cited research that used an interview technique which relied totally on preschool children's verbal fluency, was abstract and unreliable, especially the scoring. Second, the instrument had to measure the four well-defined concepts about print just listed, but not children's ability to distinguish letters and words from other types of print, or the acquisition of specific print-related skills. The four concepts we set out to measure were seen as concepts about the function of printed symbols that prereaders are likely to learn in a naturalistic setting and that are typically not the focus of formal prereading and reading programs.

Fifteen items were then developed, each judged to assess a prereader's understanding of at least one of the above four concepts. So that a correct response would reflect an understanding of the concepts of reading and writing and not simply a superficial familiarity with relevant terms, an effort was made to avoid use of terms such as "read" and "write" in the questions. The fifteen items consisted of five items for each of three types of questions.

The first five - picture choice - involved listening to a series of problems to be solved and were of the multiple choice variety. The children were shown three pictures for each question with each picture illustrating one of the alternative solutions presented. The alternatives to each solution were of three types: 1) the correct answer in which the problem was solved most efficiently by making use of a written symbol; 2) a plausible but less efficient method of solving the problem; and

3) an activity that was irrelevant to the problem presented. Children responded by pointing to the picture of the alternative they selected as the best solution.

The second five items - verbal situation - involved presenting the child with a problem (e.g., How does mom know how much water to put in the cake mix?) that could be efficiently solved using print. A verbal response consisting of a brief phrase or sentence was required of the child that was later scored as correct if it involved an appropriate print-related response.

The last five items were again multiple choice. These items - picture-word - involved presenting the child with a situation that required print. The child was shown two large index cards - one with the appropriate print and the other with a picture of something mentioned in the situation. The print-related response was always the correct one.

We administered these items to a sample of non-reading preschoolers at the Iowa State University Child Development Laboratory. At the same time, we administered an interview consisting of questions similar to those of Downing and Reid (e.g., Can you tell me a word? Can you tell me a letter?). Upon analyzing the data, we were very surprised to discover that, in spite of our astute hypothesizing, scores on our print awareness instrument and responses to the interview questions were fairly highly correlated. With hindsight, of course, it made perfect sense that children's print-related knowledge, regardless of its type, would be related. But the other surprise, and again with hindsight the more significant one, was that we discovered our intuitively derived, seat-of-the-pants instrument appeared to have some promise. Item discrimination indices were adequate as was internal consistency (see Table 1 & Table 2). Consequently, we felt compelled to pursue the usefulness of our concept of print awareness and of the instrument we designed to measure that concept. We still believed that our notion of print awareness had to play a significant role in the emergence of literacy, but we needed first to assess

the validity of our instrument. It was during that process that insights as well as questions concerning the development and function of print awareness began to emerge.

Insert Tables 1 & 2 about here

We assessed validity in several ways. The first was to obtain evidence of a developmental progression of scores to document expected changes in performance with age. The results of these data from four separate cohorts are reported in Table 3. The data show that performance on the 15 items increased with age and that variability was approximately the same for each of the age groups. In addition, it should be noted that neither ceiling nor floor effects were observed with any age group. Apparently, preschoolers are increasing their knowledge about print and the process of reading without the benefit of a formal reading program. Research on print awareness using other measures supports these data (e.g., Hiebert, 1981).

Insert Table 3 about here

Second, we reasoned that if print awareness was related to success in reading, perhaps we could discriminate between two groups of children known to differ in their reading achievement. The earliest age when reading difficulties are systematically assessed in the public schools is second grade. Consequently, we obtained a sample of 84 second graders in Greeley, Colorado. Half of those second graders had been placed in the Title I reading program because they were at least one grade level behind in reading achievement (in the fall of second grade, that makes a child

virtually a non-reader). The other half of the second grade sample were judged by their teachers to be at or above grade level in reading (determined by informal reading inventories given by teachers and placement tests provided by the schools' reading series). Each of these 84 second graders was administered the print awareness instrument in addition to a modified version of the Mow-Motorcycle Test devised by Rozin, Bressman, and Taft (1974). The latter was designed to assess knowledge of sound-symbol correspondence, a related but not identical concept to print awareness. For instance, the child is presented with two written words, one long and one short. The child is told, "One word says 'mow', the other says 'motorcycle'. Which one says 'motorcycle'?" The child who understands that more sounds in a word require more letters will choose the correct printed word. Results of these data are reported in Table 4.

Insert Table 4 about here

Title I poor readers obtained significantly lower scores than the good readers on the print awareness instrument but there were no significant differences between the two groups in performance on the Mow-Motorcycle Test (although all good readers obtained perfect scores which was not the case for poor readers). It appears that the poor readers had acquired some information about reading during formal reading instruction but their print awareness performance did not even match the level of the five- and six-year-old prereaders previously tested. These results were intriguing and also demonstrated the ability of the instrument to discriminate between two groups whose reading ability varied. However, the results were also difficult to interpret since the difference observed between the normal second graders and the Title I second graders could be attributed to possible differences

between the groups in socio-economic status or intellectual ability (both of the latter are typically confounded with reading achievement). In order to tease out any influences by these variables, two additional studies were conducted.

For the first of these additional studies, a sample of 24 middle to upper-middle class second graders was obtained whose teachers estimated that they had at least average intelligence but were reading a year or more below grade level. All 24 of these children were administered Form D of the Gilmore Oral Reading Test (Gilmore, 1968) at the Child Research and Study Center at SUNY-Albany. Those children whose reading accuracy scores were a year below grade level (n=12) were also administered the Slosson Intelligence Test (SIT, Slosson, 1963) and the Wechsler Intelligence Scale for Children (WISC-R, Wechsler, 1974). All subjects in the latter group scoring 90 or above on either the SIT or the verbal or performance subscales of the WISC-R (n=11) were classified as "poor readers with normal IQ scores" (one subject was dropped due to low IQ score). To form an additional contrast group, the 12 children whose teachers referred them but whose reading accuracy scores were too high to be poor readers, were labelled "referred poor readers." All 23 subjects from each of these groups were administered the print awareness instrument. Results can be seen in Table 4. Pairwise comparisons among the four second grade groups revealed that poor readers with normal IQ's were not significantly different in performance on the print awareness instrument from either the Title I poor readers or from referred poor readers. However, poor readers with normal IQ's obtained significantly lower print awareness scores than second grade normal readers. In addition, Title I poor readers were significantly different from the referred poor readers. In other words, all of the poor readers, regardless of how they were classified and regardless of IQ, obtained significantly lower print awareness scores from the normal second grade readers. However, the Title I poor readers obtained the very lowest scores.

The other study focusing on second graders involved a partial replication of the original Greeley study. The purpose of this third study was to vary the characteristics of the normal second grade reader comparison group. We thought that perhaps the second grade teachers in Greeley may have selected normal readers whose general abilities outstretched those of the Title I readers, making them a poor comparison group. Twenty-five Title I second graders from two Pennsylvania school districts were thus recruited to participate in the present study. Twenty-five additional non-Title I second graders (less than six months behind in reading), classmates of the Title I group, were selected by matching them to the Title I group according to gender and composite achievement test score and/or IQ scores (the latter was available for only 14 of the 50 children). Unfortunately, it became evident that the Title I children in each of these school districts had the lowest achievement scores in their classrooms. Consequently, the comparison group of non-Title I second graders consisted of the children with higher achievement scores than the Title I group but were never the children scoring at the top of their class. Achievement test scores but not IQ scores differed significantly for the group who had both scores available.

Children in each of the groups were administered the Print Awareness instrument, the Mow-Motorcycle Test, and the Sand Test (Clay, 1979; Concepts About Print Test). Results can be seen in Table 4. These data do not replicate the data collected in Greeley since no significant difference in print awareness scores appeared (although the lack of difference in Mow-Motorcycle scores was replicated). Perusal of the means reveals that the reason for the lack of significant differences in print awareness scores is that the Pennsylvania normal readers had lower print awareness scores than the Greeley normal readers. The print awareness scores for the two Title I samples were nearly identical. These results suggest that performance on the print awareness instrument may be related to general level of

achievement (r=.37; n=36 with scores on the Comprehensive Test of Basic Skills). The results are complicated, however, by the fact that there were significant differences between the two groups for their scores on the Sand test. Thus, for each measure of print awareness, the Title I poor readers obtained depressed scores, but only on the Sand test were the lower scores significantly different from non-Title I readers. It does appear that level of reading achievement is related to print awareness in one form or another.

In comparing the print awareness scores of all the second grade groups tested, they fall into three clusters. The lowest cluster consists of the two Title I samples (Greeley $\bar{X}$ = 11.2; PA $\bar{X}$ = 11.52). The middle cluster consists of the poor readers with normal IQ scores ($\bar{X}$ = 12.73) and the non-Title I matched sample ($\bar{X}$ = 12.64). The highest cluster consists of the normal second grade readers ($\bar{X}$ = 13.88) and the referred poor readers ($\bar{X}$ = 13.58). Screening poor readers for a normal IQ appears to raise average print awareness scores. Matching normal readers school achievement with poor readers appears to lower average scores. Thus, the influence of general ability/achievement factors seems to hold, while the moderate size of the achievement-print awareness relationship makes strong conclusions impossible.

One final validity study was then conducted. The purpose of the last study was three-fold. First, we wanted to know the relationship between performance on our print awareness test and intellectual functioning. Second, we were interested in knowing the relationship between print awareness as we measured it and another measure of print awareness (Sand). Third, we planned to discover the relationship between print awareness and certain traditional prereading skills. Subjects consisted of 39 three- (n=15), four- (n=18), and five-year-old (n=16) prereaders attending a day care center in Littleton, Colorado (a suburb of Denver).

Each subject was administered a battery of tests during several sessions. Tests administered include the print awareness instrument, Mow-Motorcycle Test,

the Slosson Intelligence Test, the Sand Test, and the Kindergarten Screening Battery (Steger, 1976; consisting of eight subtests assessing such pre-reading skills as rhyming, letter naming, initial sound segmentation, sound-symbol association for vowels and consonants). Pearson product-moment correlations were computed to determine relationships between scores for the entire sample and for each age group. Results are presented in Table 5. Differences between mean scores on each test as a function of age were determined but are not reported in detail here.

Insert Table 5 about here

The data analyses showed that there were highly significant age differences on every test. Three-year-olds consistently performed more poorly than five-year-olds. Four-year-olds performed like three-year-olds in some instances and like five-year-olds in others. Thus, the typical developmental increments obtained using cross-sectional data were replicated. More important, however, is the pattern of relationships among the scores revealed by the correlational analyses.

Performance on our print awareness instrument was related to IQ score (r = .36, p <.05) and to mental age (r =.63, p <.01) for the entire group. Within each age level, however, IQ score was related to print awareness score for the four-year-old group only. Mental age was related to print awareness for both five-year-olds (r = .48, p <.05) and four-year-olds (r = .75, p <.01). In general, it appears that knowledge of print as we measure it is more strongly related to a "mental maturity factor" like CA and MA than to a "mental ability factor" like IQ.

There was a moderate but significant correlation between scores on our print awareness instrument and scores on Marie Clay's Sand or Concepts About Print (r =

.55, $p < .01$). While the relationship was statistically significant, clearly these two instruments are measuring somewhat different constructs. The difference is further underscored by looking at the differences in correlations of each print awareness instrument with sound-symbol correspondence and pre-reading skills. The Sand test scores obtained a significant correlation ($r = .45$, $p < .01$) with Mow-Motorcycle scores while our print awareness instrument did not. While both print awareness tests obtained significant correlations with prereading skills from the Kindergarten Screening Battery, the correlations for the Sand were larger and more numerous. In looking at the content of our print awareness instrument and Marie Clay's, these differences make sense. The practical, skill-oriented focus of the Sand (e.g., knowing where to look on a page, identifying letters and words, noticing print inversions and line/letter reversals) are sensibly more strongly related to performance on pre-reading skills than the more abstract, conceptual focus of our instrument.

So what does all this tell us about print awareness? We seem to have a reasonably reliable, valid instrument to measure it. Is it a prerequisite, a correlate, or a consequence of literacy and reading achievement? Unfortunately, the data currently available are all correlational, rendering casual inferences impossible. Since it does not appear that we will be randomly assigning children to levels of print awareness for experimental purposes anytime soon, our best hope for the present is to look at various relationships that have been documented between print awareness and other reading related variables. The presence of consistencies or convergence among the potential relationships may help us to draw some tentative conclusions - guesstimate may be a better term.

One source of evidence is the data from the second graders. It appears that children experiencing difficulty learning to read also exhibit lower print awareness scores than their more skilled classmates. Of course this doesn't mean that lack of

print awareness caused their reading problems, particularly since the differences in scores between the normal and poor reading second represent statistical significance but are not very large functionally speaking. Nevertheless, the fact that poor second grade readers obtain print awareness scores no better than six-year-old prereaders indicates that certain consistently observed deficiencies in print awareness exist. However, it appears that these print related deficiencies may be partially related to a more pervasive factor of over-all level of intellectual functioning or school achievement.

Print awareness, as we have defined it, does not seem to predict the acquisition of pre-reading skills by preschoolers particularly well. In other words, the acquisition of skills necessary for decoding appears to develop independently from print awareness as we define it, but it does not seem to be independent of the skill-oriented concepts about print that Clay is concerned with. Skills predict skills, but conceptual knowledge does not predict skills. The implication is that our notion of print awareness may not be a prerequisite to success in formal reading instruction.

Looking at the preschool data in another way allows further judgments to be made concerning the possible role of print awareness. We divided the children into four groups based on high versus low scores for two variables; print awareness (High = above 7.3; Low = below 4.26) and symbol-sound association for consonants (a skill-related predictor of later reading success; High = above 16.33; Low = below .857). Then we looked at how well each of these four groups performed on two reading-like tasks (consonant substitution and word recognition) as a function of group membership. Results can be seen in Table 6. No statistical tests of significance were performed given extremely uneven cell frequencies and the post hoc nature of the analyses. The children who were high on symbol-sound association for consonants had higher scores on consonant substitution and word recognition than

those scoring low regardless of level of print awareness. Those high in print awareness did better (although still not particularly well) on consonant substitution and word recognition only if they also had high scores for symbol-sound association for consonants. These data reinforce the conclusion that our notion of print awareness does not appear to be a prerequisite to skill on reading-like tasks. It may be valuable to investigate this conclusion further using different and less traditional types of reading-related outcome variables.

Insert Table 6 about here

Our conclusions appear to conflict with other research indicating that print awareness scores of prereading children predict later reading achievement scores (Taylor & Blum, 1981; Day & Day, 1981). However, Ehri (1979) has pointed out that there are several possible relationships between various prereading knowledge such as print awareness and later success with reading. In addition to being a prerequisite, print awareness could be a facilitator or a correlate of reading success. Further, while it is probably not a consequence of reading success per se, print awareness may be a consequence of print-related experiences that in turn assist in reading acquisition. Thus, the likelihood presents itself that print awareness as we measure it is a facilitator or a correlate of reading success, but not a prerequisite.

Another way to look at the function of print awareness is to use Jana Mason's (1982; in press) conceptualization of prereading. Her theory distinguishes three strands of knowledge about reading. The first strand consists of knowledge about the function of print - learning that print represents language and its meaning. Our print awareness instrument appears to measure this aspect of knowledge about reading. The second strand consists of knowledge of the form and structure of print,

including naming and recognizing letters, phoneme-grapheme correspondence, etc. Subtests on the Kindergarten Screening Battery assess this type of knowledge. The third strand deals with knowledge of rules and procedures for reading, including terminology (e.g. book parts, location terms), ability to talk about reading, and even knowledge about such tasks as writing and spelling. A large portion of knowledge comprising the third strand is assessed by the Sand-Concepts About Print Test. Thus the Littleton study represents a cross-sectional assessment of all three strands of knowledge about reading in prereading preschoolers. Measures (mean score and proportion correct) of each strand for age level are presented in Table 7.

Insert Table 7 about here

Mason (1982) suggested that the three strands emerge through formal and informal instruction from the preschool period to the third or fourth grade. Consistent with that suggestion, the Littleton data reveal that five-year-olds have not reached ceiling for any of the three strands and that they have more to learn when it comes to knowledge about reading. Based on mean scores and mean proportion correct, it is clear that preschoolers are dramatically increasing their knowledge about reading for all three strands. It appears, however, that the second strand is progressing slightly more quickly than the first or third strand although Mason assumes that some knowledge represented by the first strand logically precedes knowledge contained in the other two strands. Looking at average print awareness scores for five-year-olds in all cohorts reveals that they responded correctly to 70 percent of the items rather than 49 percent as the Littleton sample did. This may indicate that the Littleton 5-year-olds were not representative in that respect.

However, it also seems consistent with the results of Hiebert, Cioffi, and Antonak (1983) indicating that mastery of reading readiness skills precedes mastery of print awareness concepts.

The Littleton data do indicate that some knowledge of all three strands is present prior to formal reading instruction and data from the entire preschool sample indicates the typical five- and six-year-old prereader has acquired the first strand, knowledge of the function of print. Mason's theory of prereading prompts us to view print awareness as just one strand out of three, that these three strands both precede and accompany beginning reading, and that the three conceptual systems represented by each strand develop as a result of formal and informal instruction. While children with some knowledge of these three systems of learning to read will be better able to profit from formal reading instruction than those without, their knowledge will continue to expand as a result of exposure to that instruction (Mason, 1982). Consistent with this theory, the difficulty with formal reading instruction experienced by the Title I second graders we tested seems to be reflected in their print awareness scores.

While our data are not a direct test of Mason's theory, we believe they are not inconsistent with the theory. Print awareness, or knowledge about the function of print, does play a role in children's transition towards literacy. However, that role is probably entwined with the role of other reading-related knowledge and together they form precursors and consequences of formal reading instruction.

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Table 1

Descriptive Statistics for the Print Awareness Test

	Total Test Score (15 items)				
		Age Group			
Statistic	All	Threes	Fours	Fives	Sixes
Mean	8.24	4.11	7.50	10.58	12.85
SD	4.09	2.42	2.92	3.64	1.28
N	150.00	35.00	50.00	52.00	13.00
KR-20	.86	.61	.68	.84	---

	Each Subtest (5 items)		
Statistic	Picture-Choice	Verbal-Situation	Picture-Work
Mean	3.16	1.87	3.21
SD	1.26	1.87	1.87
N	150.00	150.00	150.00
KR-20	.38	.85	.84

Table 2

Item Statistics (n = 150)

Item	Mean	SD	Corrected Item-Subtest Total Correlation*	Corrected Item-Total Test Score Correlation
PC1	.57	.50	.18	.28
PC2	.87	.36	.23	.41
PC3	.61	.49	.15	.26
PC4	.53	.50	.16	.25
PC5	.59	.49	.25	.36
VS1	.47	.50	.68	.66
VS2	.31	.46	.67	.61
VS3	.53	.50	.69	.70
VS4	.35	.48	.71	.70
VS5	.21	.41	.58	.52
PW1	.64	.48	.47	.39
PW2	.62	.49	.64	.55
PW3	.70	.46	.69	.60
PW4	.71	.46	.74	.62
PW5	.55	.50	.70	.60

*For each item, the correlation between that item's score and the total scores computed from the other items in the set.

Table 3
Sample Size, Mean Age in Months, and Mean Print Awarenss Score For Each Age Level Within Each Cohort and For All Cohorts Combined

Cohort	Variable	Statistic	Age Group 3	4	5	6
Iowa, 1979	Age in Months	$\bar{X}$	43.29	54.67	64.48	74.75
		(S)	(2.47)	(3.96)	(3.24)	(3.59)
	Print Awareness	$\bar{X}$	3.94	8.67	12.30	11.75
		(S)	(2.41)	(3.37)	(2.60)	(.96)
	Sample Size	N	17	15	23	4
Greeley, 1980	Age in Months	$\bar{X}$	-----	-----	66.17	72.56
		(S)	-----	-----	(2.69)	(.53)
	Print Awareness	$\bar{X}$	-----	-----	11.92	13.33
		(S)	-----	-----	(2.97)	(1.12)
	Sample Size	N	-----	-----	12	9
Iowa, 1981	Age in Months	$\bar{X}$	45.00	54.35	60.00	-----
		(S)	(2.00)	(3.00)	-----	-----
	Print Awareness	$\bar{X}$	4.33	7.06	7.0	-----
		(S)	(1.53)	(2.90)	-----	-----
	Sample Size	N	3	17	1	-----
Littleton, 1982	Age in Months	$\bar{X}$	42.07	54.28	63.50	-----
		(S)	(2.46)	(3.29)	(2.58)	-----
	Print Awareness	$\bar{X}$	4.27	6.94	7.31	-----
		(S)	(2.60)	(2.34)	(3.22)	-----
	Sample Size	N	15	18	16	-----
All Cohorts Combined	Age in Months	$\bar{X}$	42.91	54.42	64.48	73.23
		(S)	(2.52)	(3.34)	(3.24)	(2.13)
	Print Awareness	$\bar{X}$	4.11	7.50	10.58	12.85
		(S)	(2.42)	(2.92)	(3.64)	(1.28)
	Sample Size	N	35	50	52	13

Table 4

Average Test Scores for Three Second Grade Studies

		Group					
		Greeley		Albany		Penna.	
Test	Statistic	Normal	Title I Poor	Poor w/ Normal IQ	Referred Poor	Matched Normal	Title I Poor
Print Awareness	Mean	13.88	11.22	12.73	13.58	12.64	11.52
	SD	1.18	2.66	1.49	1.44	1.73	2.37
Mow Motorcycle	Mean	8.00	7.44	----	----	7.92	7.32
	SD	0.00	.92	----	----	.27	1.16
	n	43	41	11	12	25	25

Table 5

Correlations by Age Group Among Print Awareness Measures and Measures of Other Reading Skills

	AGE GROUP							
	ALL		3-yr-olds		4-yr-olds		5-yr-olds	
	SAND	PAT	SAND	PAT	SAND	PAT	SAND	PAT
PAT	.55**		.12		.39		.53*	
Age in Months	.67**	.47**	.00	.39	.17	.25	.00	.24
Mow Motorcycle	.45**	.16	-.01	.25	.22	.19	.08	-.24
Rhyme	.63**	.32*	.35	-.30	.70**	.67**	.43	-.08
Letter Names	.73**	.41*	.49*	.30	.76**	.21	.57*	.30
Sound-Sym.	.68**	.33*	.33	.33	.81**	.22	.39	.16
Symbol-Snd-C	.71**	.35*	.50*	.14	.64**	.31	.48*	.13
Cons. Sub.	.55**	.10	---	---	.50*	.26	.44*	-.18
Symbol-Snd-V	.54**	.12	---	---	.54*	.19	.35	-.15
Word Rec	.36**	-.05	---	---	.29	.34	.26	-.30
Context	.77**	.48**	.22	-.31	.70**	.57*	.53*	.33
IQ	.31*	.36*	.68**	.14	.48*	.71**	.49*	.40
Mental Age	.75**	.63**	.67**	.30	.50*	.75**	.46*	.48*

Table 6

Performance on Reading-like Tasks as a Function of Level of Print Awareness and Symbol-Sound Association for Consonants

	Print Awareness	
Symbol/Sound C	**High**	**Low**
High	$\bar{X}$ Word rec = .77 $\bar{X}$ Consonant sub= 1.00 n = 13	$\bar{X}$ Word rec. = 3.5 $\bar{X}$ Consonant sub= 2.0 n = 4
Low	$\bar{X}$ Word rec = .083 $\bar{X}$ Consonant sub= 0.0 n = 12	$\bar{X}$ Word rec. = 0.0 $\bar{X}$ Consonant Sub= 0.0 n = 16

Table 7

Preschoolers' Performance on Measures of Three Strands of Knowledge About Reading

Strand	Age Group: Three n=14	Four n=18	Five n=16
First			
Print Awareness			
$\bar{X}$	4.26	6.94	7.31
% correct	.28	.46	.49
Second			
Letter names			
$\bar{X}$	3.57	8.31	14.13
% correct	.17	.39	.67
Sym-Snd C			
$\bar{X}$	.86	6.00	16.33
% correct	.03	.20	.54
Third			
Sand			
$\bar{X}$	2.92	7.00	9.60
% correct	.12	.29	.40